AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An apparatus for coherent combining type demodulation in a communication system using orthogonal modulation, the apparatus comprising:

means for generating a phase reference signal from signals received via multi-paths;

means for detecting phase error values of the signals received via the multi-paths using the phase reference signal, respectively; and

means for compensating the received signals via the multi-paths by applying the detected phase error values thereto, respectively,

wherein the means for generating the phase reference signal comprises:

means for ~~calculating symbol energy values of the orthogonal code correlation values by~~ calculating correlation values of orthogonal ~~code correlation values~~ codes of the received signals via the multi-paths, respectively, and for calculating symbol energy values of the correlation values; and

means for adding the symbol energy values of the correlation values per each orthogonal code for the entire multi-paths to determine the orthogonal code having a maximum energy value as the phase reference signal.

2. (Original) The apparatus of claim 1, further comprising means for delaying the received signals while the phase error values detecting means detects the phase error values.

3. (Canceled)

4. (Previously Presented) The apparatus of claim 1, wherein the phase error values detecting means comprises:

means for selecting a value corresponding to the phase reference signal among the orthogonal code correlation values of the received signals via the multi-paths; and

means for performing phase estimation filtering on the selected value.

5. (Previously Presented) The apparatus of claim 4, wherein the phase estimation filtering means comprises an accumulator.

6. (Currently Amended) The apparatus of claim 1, wherein the <u>means for</u> compensating ~~means~~ <u>the received signals</u> compensates the phase errors by conjugate-complex-multiplying the received signals by the detected phase error values.

7. (Currently Amended) The apparatus of claim 1, further comprising:

an adder adding ~~the outputted~~ in-phase components of the correlation values outputted from the ~~compensating~~ means for compensating the received signals; and

means for determining a symbol value of each value outputted from the adder.

8. (Currently Amended) The apparatus of claim 1, wherein [[the]]each orthogonal code is a Walsh code.

9. (Currently Amended) A receiver in a communication system using orthogonal modulation, comprising:

a plurality of fingers; and

an index detector for detecting a Walsh index indicating a maximum ~~walsh~~ Walsh code ~~by calculating an~~ based on energy values of ~~each~~ Walsh code correlation ~~value~~ values of signals received via multi-paths~~; and a~~,

wherein each of the energy values are provided by each of the plurality of fingers, and the plurality of fingers ~~for~~ are capable of receiving the Walsh index generated from the index detector and ~~for~~ are capable of compensating the signals received via the multi-paths, respectively.

10. (Currently Amended) The receiver of claim 9, wherein each of the fingers comprises:

a despreader for despreading I and Q-component signals received via the corresponding multi-paths;

a first transformer and a second ~~transformers~~ transformer for finding Walsh correlation values of the despread I and Q-component signals;

an energy detector for finding symbol energy values of the Walsh correlation values to output to the index detector;

a phase estimator for estimating phase error values of the Walsh correlation values by generating the Walsh correlation value corresponding to the Walsh index as a phase reference signal;

a first delayer and a second ~~delayers~~ delayer for delaying the despread I and Q-component signals until the corresponding phase error value is outputted from the phase estimator;

a phase rotator for compensating phase errors of the despread signals by applying the estimated phase error values to the despread signals delayed by the first delayer and the second ~~delayers~~ delayer; and

a third transformer for finding the Walsh correlation values of the phase-compensated despread I-component signals.

11. (Previously Presented) The receiver of claim 10, wherein the phase estimator compensates the corresponding phase error by conjugate-complex-multiplying the corresponding despread signal by the corresponding detected phase error value.

12. (Original) The receiver of claim 10, further comprising:

an adder adding output values of the third transformer to output; and

a decider determining a symbol value corresponding to the I-component Walsh correlation value outputted from the adder.

13. (Previously Presented) A receiver using a coherent combining technique in a communication system using orthogonal modulation, comprising:

a plurality of fingers for despreading received signals and outputting first outputs corresponding to Walsh code energy values calculated by using a correlation value of each walsh code and the despread signals and second outputs by compensating the correlation value by performing phase estimation filtering for the correlation value according to a control signal; and

a combiner for outputting the control signal indicating the walsh code having a maximum energy value of the first outputs to each fingers and a symbol for a walsh code set by combining the second outputs.

14. (Previously Presented) A coherent combining type demodulation method in a mobile communication system, comprising:

generating a phase reference signal using signals received via multi-paths; and

compensating each of the signals received via the multi-paths using the phase reference signal to demodulate the corresponding received signal,

wherein generating the phase reference signal comprises:

finding correlation values for orthogonal codes and the received signals; and

adding energy of the correlation values for the orthogonal codes for the entire multi-paths per each of the orthogonal codes and selecting a maximum energy to generate as the phase reference signal.

15. (Canceled)

16. (Previously Presented) The coherent combining type demodulation method of claim 14, wherein the phase error compensating step comprises:

detecting phase error values of the received signals via the multi-paths, respectively using the phase reference signal;

compensating the received signals via the multi-paths by applying the detected phase error values thereto, respectively; and

combining the phase-error-compensated signals to demodulate the received signals.

17. (Previously Presented) The coherent combining type demodulation method of claim 14, further comprising delaying the corresponding received signal while the corresponding phase error value is detected.

18. (Original) The coherent combining type demodulation method of claim 17, wherein phase compensation of the delayed signal is accomplished by conjugate complex multiplication between the received signal and the phase error value.

19. (Previously Presented) The coherent combining type demodulation method of claim 17, wherein combining the phase-error-compensated signal to demodulate the received signals comprises:

adding in-phase components among the correlation values of the respective multi-paths outputted from the phase error compensation to output corresponding values; and

determining symbol values of the outputted corresponding values.

20. (Previously Presented) The coherent combining type demodulation method of claim 14, wherein the orthogonal code is a Walsh code.

21. (Previously Presented) A coherent combining type demodulation method using orthogonal modulation in a communication system, comprising:

receiving signals via multi-paths and dispreading the received signals for the corresponding multi-paths, respectively;

finding Walsh correlation values of the despread signals;

finding symbol energy values of the Walsh correlation values and detecting a Walsh index having a maximum symbol energy among the symbol energy values;

estimating phase error values of the Walsh correlation values by generating the Walsh correlation value corresponding to the Walsh index as a phase reference signal;

delaying the despread signals until the corresponding phase error value is outputted;

compensating the despread signals by applying the estimated phase error values to the delayed despread signals, respectively; and

finding the Walsh correlation values of the phase-compensated despread signals.

22. (Previously Presented) The coherent combining type demodulation method of claim 21, further comprising:

adding to output I (in-phase) components of the Walsh correlation values of the phase-compensated despread signals; and

determining symbol values of the I (in-phase) components.